Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

ORIGINAL

In the Matter of	)	
	)	
Amendment of part 2 of the Commission's Rules to Allocate Additional Spectrum to the Inter-Satellite, Fixed, and Mobile Services and to Permit Unlicensed Devices to Use Certain Segments in the 50.2-50.4 GHz and 51.4-71.0 GHz Bands	)	ET Docket No. 99-261

Comments of Nokia Telecommunications Inc.

Nokia Telecommunications Inc. ("Nokia") by its counsel and pursuant to Section 1.415 of the Rules of the Federal Communications Commission ("Commission"),[1] respectfully submits these Comments in response to the *Notice of Proposed Rule Making* in the above-captioned proceeding.[2]

I. Introduction and Overview

Nokia is the world's leading supplier of mobile telephones and is a global leader in the manufacture of telecommunications infrastructure products, including those used in mobile, fixed, and Internet Protocol networks. Nokia maintains manufacturing facilities in 10 countries and has more than 51,000 employees in over 45 countries around the world, including over 6,000 employees in the United States. Nokia is paving the way to the mobile information society with its innovative products and solutions.

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[1] *See* 47 C.F.R. § 1.415.

[2] ET Docket No. 99-261, *Notice of Proposed Rule Making* (FCC 99-183, rel. July 23, 1999), ("*Notice*").

Nokia is pleased to have this opportunity to comment on the Commission's proposals to allocate additional spectrum for fixed and mobile services in certain bands above 50 GHz. Specifically, Nokia endorses and supports the Commission's proposal to make the 57-59 GHz and 64-66 GHz bands available for High Density Fixed Service ("HDFS") use on an unlicensed basis under Part 15 of the Commission's rules.[3]

The subject spectrum lays unused today, but recent technological advances will permit its beneficial use for a variety of applications. As the Commission correctly noted when allocating 59-64 GHz for unlicensed use, this band can support a number of general unlicensed devices "such as wireless local area networks, campus-wide links, roadway communications and the like."[4] Expanding the 59-64 GHz band to encompass 57-66 GHz will increase the ability of carriers to expand these and similar operations. As the Commission observes in its *Notice*, infrastructure equipment is now feasible and is becoming available that will allow PCS and cellular operators to use this band to connect base stations to one another in high-density urban areas.[5] Deployment of this technology would allow operators to increase capacity to provide higher quality service to a large number of subscribers in high density urban areas. To permit this infrastructure to be introduced as expeditiously as possible, the Commission should expand the existing allocation at 59-64 GHz to include the entire 57-66 GHz range. To

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[3] *See Notice* at ¶¶ 15-17.

[4] *See Amendment of Parts 2, 15, and 97 of the Commission's Rules to Permit Use of Radio Frequencies Above 40 GHz*, ET Docket 94-124, *First Report and Order*, 11 FCC Rcd 4481 (1996), at ¶ 28.

[5] *See Notice* at ¶¶ 2, 16.

effect this expansion, the Commission should adopt technical rules that authorize operations in this band on an unlicensed basis, subject to the existing spectrum etiquette applicable to operation within the 59-64 GHz band.[6]

II. Allocating the Entire 57-66 GHz Band for High Density Fixed Service Applications will Create Spectrum Efficiencies Across Multiple Frequency Bands, and Improve the Performance of Existing Mobile Networks.

The allocations proposed in this proceeding are congruent with international allocation changes that the U.S. successfully promoted at the 1997 World Radio Communications Conference ("WRC-97").[7] In proposing to adopt these WRC-97 allocations domestically, the Commission cites two specific results of WRC-97. First, the Commission cites the addition of footnote S5.547 to the International Table of Frequency Allocations which makes the 51.4-52.6, 55.78-59, and 64-66 GHz bands available for high density fixed service ("HDFS").[8] Second, the Commission references WRC-97 Resolution 726 which states, *inter alia*:

> [T]here is a dramatically increasing demand for high-density applications in the fixed service resulting from the deployment of new mobile networks and the rapid worldwide deregulation in the provision of local broadband services . . . . There is a need for global harmonization of new and existing allocations of radio frequency bands to facilitate coordination between administrations, encourage development of competitive products through economies of scale, and the worldwide introduction of new telecommunication services . . . .[9]

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[6] *See* 47 C.F.R. § 15.255.

[7] *See International Telecommunications Union Final Acts of the World Radio Communication Conference 1997, Geneva, 1997*, ("*WRC-97 Final Acts*").

[8] *See Notice* at 14.

[9] *WRC-97 Final Acts* at Resolution 726.

Considering the conclusions and objectives of Resolution 726, the Commission seeks comment on whether footnote S5.547 should be adopted domestically.[10] Nokia strongly supports the adoption of footnote S5.547.

As a manufacturer of HDFS equipment, Nokia can attest to the growing demand for HDFS applications. Allocation of the entire 57-66 GHz band for HDFS in the U.S. will promote the efficient use of this spectrum, and will increase spectrum efficiency in the increasingly congested PCS and cellular bands. As subscriber rates grow across the country, mobile carriers need to focus on improved quality and customer satisfaction. Maintaining sufficient network capacity is a key part of this goal, because consumers will no longer tolerate the dropped or blocked calls that result from network congestion.

The most critical network capacity requirements come from high density traffic areas, so-called "hot spots." The size of these hot spots varies, but they may range from a few square kilometers to tens of square kilometers. In order to be able to respond to these potentially large hot spots, carriers need to be able to expand their network capacity quickly to maintain high levels of customer service. Traditionally, carriers have pursued multiple strategies for increasing capacity, including adding transceivers, cell splitting, and frequency hopping. However, as demand continues to rise in dense metropolitan areas, most networks will eventually need to deploy a microcellular network.

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[10] *Notice* at ¶14.

Traditionally, microcellular networks are deployed on the same bands of spectrum as the rest of the network. For example, 1.9 GHz for PCS mobile links, and 2.1, 6, or 11 GHz for fixed links between base stations. Now, Nokia has developed technology that can use the 57-59 GHz band for the fixed link between base stations, thereby easing congestion on the 2.1, 6, and 11 GHz bands. Nokia has already begun deploying this type of equipment in the 57-59 GHz band in Europe. By harmonizing U.S. and international allocations, the Commission will foster economies of scale that will encourage the introduction of this spectrally efficient technology in the U.S.

In addition to being spectrally efficient, Nokia's 57-59 GHz equipment is more cost-effective than alternative microcellular solutions. Because of its compact design, Nokia's microcellular system can be deployed on sites that would otherwise be unavailable, such as building walls, billboards, and lamp posts. By dramatically decreasing site acquisition and operational costs, Nokia's microcellular solution will result in network cost reductions that can be passed on to consumers creating the dual benefit of improved service – fewer dropped calls – and lower costs.

III. The 57-59 and 64-66 GHz Bands Should be Available on an Unlicensed Basis.

Generally, communications applications that operate pursuant to Part 15 of the Commission's rules are required to operate on a non-interference basis. Simply stated, this means that Part 15 operations must be able to tolerate interference from, and may not cause harmful interference to any other authorized user of the electromagnetic

spectrum.[11] In the *Notice*, the Commission tentatively concludes that the 57-59 GHz and 64-66 GHz bands should be available for unlicensed devices under Part 15 of the Commission's Rules because the short propagation paths that are characteristic of this band make it ideally suited "for high re-use, short range communications with a correspondingly low probability of co-channel interference."[12] Nokia agrees with this conclusion and urges the Commission to make the entire 57-66 GHz band available on an unlicensed basis in this proceeding. The same conclusions regarding suitability for Part 15 use should apply to the entire band because the propagation characteristics of the 59-64 GHz band, which is already available for Part 15 use, are essentially the same as those for the proposed 57-66 GHz band.

Radio signals in the 57-66 GHz range can travel only a few kilometers. However, for certain communications applications, these short propagation characteristics are an advantage rather than a detriment. In fact these characteristics can result in very efficient spectrum utilization. Because these systems operate at such short range with such high propagation loss, there is a low probability that undesired signals will be received by other users operating in the same band. When carefully managed, these propagation characteristics permit multiple co-channel users to occupy

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[11] *See* 47 C.F.R. §15.5.

[12] *Notice* at note 55. *See also*, *Millimeter Wave Propagation: Spectrum Management Implications*, OET Bulletin Number 70 (July 1997).

the same spectrum in close proximity without causing each other harmful interference, which is the very hallmark of spectrum that is appropriate for unlicensed use.[13]

As the Commission notes, the European Radio Communications Committee ("ERC") also has concluded that the 57-59 GHz band is appropriate for unlicensed use.[14] Making this spectrum available on the same basis in the U.S. as it is in Europe will allow equipment manufacturers to benefit from the economies of scale gained by being able to design and build equipment that can operate in both markets. These economic efficiencies will be passed on to service providers allowing them to more rapidly and inexpensively expand their networks in this country, which should ultimately lead to lower costs and better service for consumers.

As noted above, technology is now becoming available that can be quickly and inexpensively deployed in the 57-66 GHz band that can provide a whole range of advanced services, including digital video links, position sensors, and point-to-point data links. By adopting its tentative conclusion to make the 57-59 and 64-66 GHz bands available on an unlicensed basis, the Commission will facilitate and accelerate the deployment of these new services.

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[13] *See* note 11 *supra*.

[14] *Notice* at ¶ 16 (*citing*, "Radio Frequency Channel Arrangement for Fixed Services Operating in the Band 57.0-59.0 GHz Which Do Not Require Frequency Planning," CEPT/ERC Recommendation 12-09 (The Hague 1998)).

IV. The Commission Should Employ the Existing Spectrum Etiquette from the 59-64 GHz Band Throughout the Extended 57-66 GHz Band.

While Nokia commends and supports the Commission's tentative conclusion to make the 57-66 GHz band available on an unlicensed basis, Nokia urges the Commission to adopt appropriate technical rules for this band in this rulemaking proceeding rather than deferring that action to a separate proceeding.[15] Specifically, the spectrum sharing etiquette applicable to the 59-64 GHz band should also be applied to the 57-59 and 64-66 GHz bands. Such rules are vital to the effective use of these frequencies on an unlicensed basis because they will facilitate use of these frequencies by the maximum number of users.

A sufficient record already has been established that justifies applying to the entire 57-66 GHz band the spectrum sharing etiquette already adopted for the 59-64 GHz band.[16] Adoption of the spectrum sharing etiquette came after an extended proceeding concluded just last year.[17] In adopting the spectrum sharing etiquette, the Commission noted that no comments were filed in opposition to the etiquette, and that the etiquette "provides the best plan to maximize the number of users and minimize the potential for interference in the 59-64 GHz band . . . [and] will accelerate the

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[15] *See Notice* at ¶ 18. (The Commission expressed its intention to initiate a separate proceeding to address appropriate technical rules for these bands.)

[16] *See* 47 C.F.R. § 15.255.

[17] *See* ET Docket No. 94-124, *Third Report and Order*, (FCC 98-150)(rel. July 15, 1998).

development of low cost devices."[18] These conclusions apply with equal force to the entire extended 57-66 GHz band. Accordingly, Nokia urges the Commission to apply the same spectrum sharing etiquette to the 4 GHz being added to the band in this proceeding in order to permit seamless utilization. Not applying the etiquette to the band extensions would hinder band unification and in effect create multiple bands: 59-64 GHz wherein the existing spectrum etiquette applies; and 57-59 and 64-66 GHz, where potentially disparate service rules would apply. Such an unnecessary bifurcation would only serve to defeat the economies of scale created by the harmonization of international allocations, and would have a chilling effect on the technological innovation necessary to maximize the beneficial use of this band. This result would delay accomplishing the objectives for expanding the 59-64 GHz band to 57-66 GHz band in order to provide additional capacity for the same and possibly additional uses.

In the alternative, if the Commission decides to initiate a separate rulemaking proceeding to adopt technical rules for this spectrum, use of this spectrum pursuant to the existing spectrum sharing etiquette for the 59-64 GHz band should be permitted on an interim basis. Allowing access to this spectrum on an interim basis would be entirely consistent with Commission precedent.[19] In fact, the Commission permitted

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[18] *Id* at ¶ 11.

[19] *See also Amendment of the Commission's Rules to Provide for Operation of Unlicensed NII Devices in the 5 GHz Frequency Range*, ET Docket No. 96-102, 12 FCC Rcd 1576 (1996)(Adopting minimum technical rules pending industry adopting of appropriate etiquette protocols); *see also Amendment of Part 90 of the Commission's Rules to Adopt Regulations for Automatic Vehicle Monitoring Systems*, PR Docket No

using the etiquette in the 59-64 GHz band while it considered adoption of the etiquette, stating that not to do so "would be detrimental to the introduction of new products and services . . . [and] that permitting interim operation would serve the public interest by permitting early rollout of new and innovative technologies and services."[20] The public interest considerations for the extended 57-66 GHz band are identical to those underscored by the Commission in permitting interim access to the 59-64 GHz band.

As noted above, Nokia is prepared to introduce network infrastructure for the 57-66 GHz band that will dramatically increase the efficiency of existing PCS and cellular network infrastructure. However, the introduction of this equipment requires that an effective spectrum sharing etiquette be in place to minimize the potential for co-channel interference. Accordingly, Nokia urges the Commission to immediately adopt, if only on an interim basis, the existing spectrum sharing etiquette for the entire 57-66 GHz band.

93-61, 10 FCC Rcd 4695 (1995)(Adopting final rules for the licensing of AVM systems which had been licensed on an interim basis since 1974).

[20] ET Docket No. 94-124, *Memorandum Opinion and Order*, (FCC 97-267)(rel. August 14, 1997) 62 FR 45330, 45380 at ¶ 12.

V. Conclusion

Nokia commends the Commission for taking this important step to expand the 59-64 GHz band and to harmonize U.S. and international frequency allocations. In particular, Nokia strongly supports the Commission's proposal to add the 57-59 and 64-66 GHz bands to the 59-64 GHz band so that the entire range will be available for HDFS use on an unlicensed basis. Nokia urges the Commission to adopt simultaneously the existing spectrum sharing etiquette for the added portions of the expanded band to ensure that use will not be delayed unnecessarily.

Respectfully submitted,

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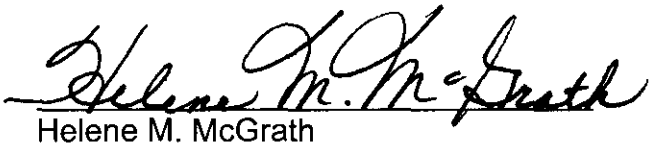

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